
**Version with markings to show changes made**

IN THE SPECIFICATION

1) page 12, last paragraph, page 13, first paragraph, please replace this text with the following:

Referring now specifically to Figs. 4a through 4d, Fig. 4a shows in cross section the package of the invention with heat spreader 40 in which grooves 42 have been provided. The grooves divide the heat spreader 40 into a number of sections, determined by the number of grooves that are provided in a surface of heat spreader 40. For the example of heat spreader 40 that is shown in top view in Fig. 4c, two grooves 42 are provided dividing the heat spreader into four sections. For the example of heat spreader 44 that is show in top view in Fig. 4d, four grooves 46 are provided dividing the heat spreader into nine sections. This [diving] dividing of the heat spreader results in the separate sections of the heat spreader functioning in an almost independent manner, whereby the typical stresses that occur in the surface of the heat spreader are now diverted to the (regions of) the grooves. In concentrating thermal and mechanical stresses from across the surface of the

heat spreader to the regions of the grooves of the heat spreader, these stresses are greatly reduced in the surface of the semiconductor die 12, the solder bumps 11 and the contact balls 26. This placement of the stress in the regions of the grooves results in enhanced reliability performance of the semiconductor die 12 and the underlying substrate 10 on which the die is mounted. In addition, thermal and mechanical stress will be reduced on points of electrical contact that are used to interconnect die 12 such as the solder bumps 11 and the contact balls 26. Since the number of grooves that is provided in the surface of the heat spreader is limited, no significant amount of material of the heat sink is removed which results in little or no negative impact on the thermal performance of the package. Grooves 42 and 46 can be created using methods of etching, machining or punching of the surface of the heat spreader.

2) page 1, the title of the invention, please replace the first-line entry [GROOVED HEAT SPREADER FOR STRESS REDUCTION IN IC PACKAGE] with the entry METHOD OF FABRICATING AS GROOVED HEAT SPREADER FOR STRESS REDUCTION IN AN IC PACKAGE

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A method of [creating] applying a heat spreader [for use] in a semiconductor package, comprising the steps of:

providing a semiconductor die;

providing a substrate over the surface of which the semiconductor device is to be mounted;

providing a stiffener for the semiconductor package;

mounting the semiconductor device over the substrate, providing an adhesive interface for the stiffener, placing the stiffener in position and establishing electrical contact between the semiconductor device and the substrate; providing a heat spreader having a first and a second surface for a semiconductor package, [; and

providing] the heat spreader having been provided with at least one groove across said heat spreader;

providing an adhesive interface for the heat spreader; and

placing the heat spreader over the adhesive interface there-of.

2. (Amended) The method of claim 1, said heat spreader being a rectangular cube having [two large] parallel first and [a] second surfaces of equal surface area bounded by four interconnecting surfaces, a surface area of said interconnecting surfaces being smaller than the surface area of said first and [a] second [large] surfaces by [a measurable] an amount, the first surface of said heat spreader [having been designated as being the side that faces a] facing the semiconductor die after mounting said die in [a] the semiconductor package of which said heat spreader is an integral part[, said first surface facing said die].

4. (Amended) The method of claim 1 wherein said at least one groove comprises four grooves, a first and a second of said four grooves intersecting a third and a fourth of said four grooves, said first and said second of said four grooves being provided at a distance from first side boundaries of said first surface [in accordance with a first equation], said third and said fourth of said four grooves being provided at a distance from second side boundaries of said first surface [in accordance with a second equation].

5. (Amended) The method of claim 1 wherein said at least one groove comprises a multiplicity of grooves, a first half of said

multiplicity of grooves intersecting a second half of said multiplicity of grooves, said first half of said multiplicity of grooves being provided at distances from first side boundaries of said first surface [in accordance with a first equation], said second half of said multiplicity of grooves being provided at [a distance] distances from second side boundaries of said first surface [in accordance with a second equation].

Claims 7-10: please cancel claims 7-10.

11. (Amended) A method of creating a semiconductor package, comprising the steps of:

providing a semiconductor device mounting support, said semiconductor device mounting support having a first and a second surface, first points of electrical contact having been provided in said first surface of said semiconductor device mounting support, second points of electrical contact having been provided in said second surface [of said semiconductor device mounting support], one or more layers of interconnect lines having been provided in said semiconductor device mounting support or on the first or second surface of said semiconductor device mounting support;

providing a semiconductor [devices] device, said semiconductor device having been provided with points of

electrical contact in a first surface of said semiconductor device;

positioning said semiconductor device above the second surface of said semiconductor device mounting support, said first surface of said semiconductor device facing said second surface of said semiconductor device mounting support, aligning and establishing contact between said points of electrical contact provided in said first surface of said semiconductor device and said points of electrical contact provided in said second surface of said semiconductor device mounting support;

establishing electrical continuity between said points of electrical contact provided in said first surface of said semiconductor device and said points of electrical contact provided in said second surface of said semiconductor device mounting support by a reflow of said points of electrical contact provided in the first surface of said semiconductor device;

providing an underfill for said semiconductor device, leaving a second surface of said semiconductor device exposed;

applying a first adhesive layer over the second surface area of the said semiconductor device mounting support that is not being covered by said underfill;

providing a semiconductor device stiffener having a first and a second surface, said stiffener having been provided with

an opening penetrating from said first to said second surface of said stiffener and of adequate size for insertion of said semiconductor device;

positioning said stiffener over the first adhesive layer applied over the second surface of said semiconductor device mounting support, said first surface of said stiffener facing said first adhesive layer, said opening provided in said stiffener being aligned with said semiconductor device mounted on the second surface of said semiconductor device mounting support, said stiffener making contact with said first adhesive layer;

applying a second adhesive layer over the second surface of said semiconductor device and the second surface of said stiffener;

providing a heat spreader having a first and a second surface, said first surface of said heat spreader having been provided with a pattern of grooves, said pattern of grooves comprising at least one groove dividing the surface area of said first surface in sections;

positioning the first surface of said heat spreader over the surface of said second adhesive layer;

providing said first surface of said semiconductor device mounting support with a solder mask, openings in said solder

mask exposing said contact points provided in said first surface of said semiconductor device mounting support;

inserting solder balls into said openings provided in said solder mask; and

establishing electrical continuity between said solder balls inserted in said openings in said solder mask and said contact points provided in said first surface of said semiconductor device mounting support by a process of reflow.

14. (Amended) The method of claim 11 wherein said pattern of grooves comprises four grooves, a first and a second of said four grooves intersecting a third and a fourth of said four grooves, said first and said second of said four grooves being provided at [a distance] distances from first side boundaries of said first surface [in accordance with a first equation], said third and said fourth of said four grooves being provided at [a distance] distances from second side boundaries of said first surface [in accordance with a second equation].

15. (Amended) The method of claim 11 wherein said pattern of grooves comprises a multiplicity of grooves, a first half of said multiplicity of grooves intersecting a second half of said multiplicity of grooves, said first half of said multiplicity of grooves being provided at distances from first side boundaries

of said first surface [in accordance with a first equation], said second half of said multiplicity of grooves being provided at [a distance] distances from second side boundaries of said first surface [in accordance with a second equation].

Claims 17-21: please cancel claims 17-21.